

CLAIMS

1. A method of assembling an internal combustion engine, said engine comprising a crankcase having an open top and a closed bottom for receiving a crankshaft, a crankshaft, a plurality of connecting rods and pistons with piston rings, and an extruded cylinder block with a cylinder bore for each of said pistons, said bores extending from a top surface to a bottom surface of the block, said method comprising the steps of:

placing an assembly comprising said crankshaft, connecting rods and pistons into said crankcase through said open top of said crankcase, said pistons and a portion of said connecting rods extending out of the open top of said crankcase;

compressing said piston rings on each of said pistons to fit into bores in said cylinder block;

inserting said pistons into said block so that they enter the corresponding bores at said bottom surface of said block while releasing the compression of said rings as they are received into each respective bore; and

attaching said crankcase to said block.

2. A method as recited in claim 1 further comprising the step of:
lowering said block over said pistons so that its bottom surface lies in a plane parallel to a plane formed by said open top surface of said crankcase.

3. A method as recited in claim 2 wherein during said lowering step, each of said pistons are coaxial with said corresponding bores.

4. A method as recited in claim 1 further comprising the step of:
aligning said plurality of pistons so that their respective top surfaces are generally co-planar and parallel to a plane formed by said block

bottom surface so said pistons simultaneously enter said cylinder bores through said bottom surface.

5. A method as recited in claim 1 wherein said compressing step further includes using separable semi-circular piston ring compression fixture elements to enclose and simultaneously compress all of said piston rings.

6. A method as recited in claim 5 wherein said fixture elements are spaced above said crankcase around said pistons in a plane parallel to a plane formed by said open top surface of said crankcase.

7. A method as recited in claim 1 wherein said engine further comprises a mid-plate, and said mid-plate is placed over said open top of said crankcase with holes for said extending connecting rods.

8. A method of assembling an internal combustion engine using a piston ring compression fixture, said engine comprising a crankcase having an open top for receiving a crankshaft and a closed bottom, a crankshaft with a plurality of attached connecting rods, said connecting rods having attached pistons with piston rings, and an extruded cylinder block with a flat bottom surface and flat top surface with a cylinder bore for each of said pistons extending through the block from said top to said bottom surfaces, said method comprising the steps of:

positioning said crankcase with its open top upright to receive said crankshaft with attached connecting rods and pistons through said open top, said open top being generally flat and defining a plane;

placing said crankshaft through said open top to rest on said closed bottom of said crankcase with said pistons and piston rings and a portion of said connecting rods extending above said open top;

locating said pistons and rings at a common level above the plane of said open top of said crankcase;

simultaneously compressing all of said piston rings with said compression fixture;

locating said cylinder block over said fixture with said cylinder bores each aligned with a piston whereby said flat bottom of said block lies in a plane parallel to said crankcase open top plane;

inserting said pistons with the compressed rings into the bores of said block;

removing said compression fixture; and

lowering said block with said inserted pistons for attachment to said crankcase.

9. A method of inserting a plurality of pistons with piston rings in an extruded cylinder block, said pistons having co-planar top surfaces and said block having a flat bottom surface with a cylinder bore therein for each of said pistons, said method comprising the steps of:

simultaneously compressing said piston rings on all of said pistons to fit into said cylinder bores;

placing said block with respect to said pistons so that its bottom surface is in a plane parallel to said co-planar piston top surfaces; and

inserting said pistons through said bottom surface into said cylinder bores with said pistons rings being released from said compression as the rings enter said bores.